AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1.   (Cancelled).

Claim 2.   (Currently Amended) The cell search method according to ~~Claim 1~~ any one of Claims 4-6, characterized in that said second averaging time is different from said first averaging time.

Claim 3.   (Original)   The cell search method according to Claim 2, characterized in that said first averaging time is longer than said second averaging time.

Claim 4.   (Currently Amended) [[The]] A cell search method ~~according to Claim 1,~~ for a mobile station in a mobile communication system, the method being characterized ~~in that~~ said repeating step ~~includes a step of~~ by comprising steps of:

despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

descrambling a common pilot signal on the basis of said detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

detecting, concurrently with the step of detecting said frame boundaries and said scramble code group or the step of detecting said scramble code, second slot boundaries on the basis of a fourth average correlation value calculated through primary averaging executed at intervals of second averaging time;

determining whether or not the detected frame boundaries and scramble code are correct; and

repeating the process starting from the step of detecting said frame boundaries and said scramble code group on the basis of said detected second slot boundaries, if the incorrectness of said frame boundaries or said scramble code is determined, including: comparing the time elapsed since the start of the step of detecting said first slot boundaries with a predetermined upper limit value and ending the repetition if it is determined as a result of the comparison that said elapsed time exceeds said upper limit value.

Claim 5.   (Currently Amended) [[The]] A cell search method according to Claim 1, for a mobile station in a mobile communication system, the method being characterized in that said repeating step includes a step of by comprising steps of:

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PAGE 12/33 * RCVD AT 12/1/2005 6:19:37 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/24 * DNIS:2738300 * CSID:8013281707 * DURATION (mm-ss):11-56

despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

descrambling a common pilot signal on the basis of said detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

detecting, concurrently with the step of detecting said frame boundaries and said scramble code group or the step of detecting said scramble code, second slot boundaries on the basis of a fourth average correlation value calculated through primary averaging executed at intervals of second averaging time;

determining whether or not the detected frame boundaries and scramble code are correct; and

repeating the process starting from the step of detecting said frame boundaries and said scramble code group on the basis of said detected second slot boundaries, if the incorrectness of said frame boundaries or said scramble code is determined, including: comparing the number of times that said frame boundaries and said scramble code have been detected with a predetermined upper limit value and ending the repetition if it is determined as a result of the comparison that said number of times exceeds said upper limit value.

Claim 6.   (Currently Amended) [[The]] A cell search method ~~according to Claim 1,~~ for a mobile station in a mobile communication system, the method being characterized ~~in that the step of detecting said second slot boundaries comprises~~ by comprising steps of:

despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

descrambling a common pilot signal on the basis of said detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

detecting, concurrently with the step of detecting said frame boundaries and said scramble code group or the step of detecting said scramble code, second slot boundaries on the basis of a fourth average correlation value calculated through primary averaging executed at intervals of second averaging time, including: calculating a fifth average correlation value by executing secondary averaging on the basis of said first average correlation value and said already calculated fourth average correlation value, and detecting second slot boundaries on the basis of the calculated fifth average correlation value;

determining whether or not the detected frame boundaries and scramble code are correct; and

repeating the process starting from the step of detecting said frame boundaries and said scramble code group on the basis of said detected second slot boundaries, if the incorrectness of said frame boundaries or said scramble code is determined.

Claim 7.   (Currently Amended) The cell search method according to Claim [[1]] 6, characterized in that said secondary averaging is a process of carrying out averaging after weighting said first average correlation value and said already calculated fourth average correlation value.

Claim 8.   (Original)   The cell search method according to Claim 7, characterized in that said weighting values are adaptively different from each other.

Claim 9.   (Currently Amended) The cell search method according to Claim 8, characterized in that the correspondence between said weighting value and becomes smaller for said first average correlation value is such that-the more previously said first average correlation value is calculated relative to the time of the secondary averaging, the smaller said weighting value is.

Claim 10.   (Currently Amended) The cell search method according to Claim 9, characterized in that a decreasing rate at which of said weighting value decreases increases consistently with becomes relatively higher according to a movement speed of said mobile station.

Claim 11.   (Original)   The cell search method according to Claim 6, characterized in that said secondary averaging is a process of carrying out averaging after multiplying said first average correlation value and said already calculated fourth average correlation value by respective forgetting factors.

Claim 12.   (Original)   The cell search method according to Claim 11, characterized in that values of said forgetting factors are adaptively different from each other.

Claim 13.   (Original)   The cell search method according to Claim 12, characterized in that the value of said forgetting factor decreases consistently with the movement speed of said mobile station.

Claim 14.   (Currently Amended) [[The]] A cell search method ~~according to Claim 1,~~ ~~characterized by further comprising a step of~~ for a mobile station in a mobile communication system, the method being characterized by comprising steps of:

despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

descrambling a common pilot signal on the basis of said detected frame boundaries and

scramble code group, and detecting a scramble code on the basis of a third average correlation

value;

detecting, concurrently with the step of detecting said frame boundaries and said

scramble code group or the step of detecting said scramble code, second slot boundaries on the

basis of a fourth average correlation value calculated through primary averaging executed at

intervals of second averaging time;

determining whether or not the detected frame boundaries and scramble code are correct;

repeating the process starting from the step of detecting said frame boundaries and said

scramble code group on the basis of said detected second slot boundaries, if the incorrectness of

said frame boundaries or said scramble code is determined; and

determining a state of said mobile station, [[and]] wherein said repeating step is executed

if at the step of determining the state, it is determined that said mobile station is communicating.

Claim 15.   (Original)   A cell search method for a mobile station in a mobile

communication system, the method being characterized by comprising steps of:

despreading a received signal with a spreading code common to all slots and detecting

first slot boundaries on the basis of a first average correlation value calculated at intervals of first

averaging time;

despreading said received signal with different spreading codes for said respective slots

on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble

code group on the basis of a second average correlation value;

descrambling a common pilot signal on the basis of said detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

detecting, concurrently with the step of detecting said frame boundaries and said scramble code group or the step of detecting said scramble code, second slot boundaries on the basis of a fourth average correlation value calculated through primary averaging executed at intervals of second averaging time; and

suspending the step of detecting said frame boundaries and said scramble code group or the step of detecting said scramble code and repeating the process starting from the step of detecting said frame boundaries and said scramble code group on the basis of said second slot boundaries detected during a present search, if the detected second slot boundaries are different from said second slot boundaries detected during a last cell search.

Claim 16.   (Original)   The cell search method according to Claim 15, characterized in that said second averaging time is different from said first averaging time.

Claim 17.   (Original)   The cell search method according to Claim 16, characterized in that said first averaging time is longer than said second averaging time.

Claim 18.   (Original)   The cell search method according to Claim 15, characterized in that said repeating step includes a step of comparing the time elapsed since the start of the step of detecting said first slot boundaries with a predetermined upper limit value and

ending the repetition if it is determined as a result of the comparison that said elapsed time exceeds said upper limit value.

Claim 19.   (Original)   The cell search method according to Claim 15, characterized in that said repeating step includes a step of comparing the number of times that said frame boundaries and said scramble code have been detected with a predetermined upper limit value and ending the repetition if it is determined as a result of the comparison that said number of times exceeds said upper limit value.

Claim 20.   (Original)   The cell search method according to Claim 15, characterized in that the step of detecting said second slot boundaries comprises calculating a fifth average correlation value by executing secondary averaging on the basis of said first average correlation value and said already calculated fourth average correlation value, and detecting second slot boundaries on the basis of the calculated fifth average correlation value.

Claim 21.   (Original)   The cell search method according to Claim 20, characterized in that said secondary averaging is a process of carrying out averaging after weighting said first average correlation value and said already calculated fourth average correlation value.

Claim 22.   (Original)   The cell search method according to Claim 21, characterized in that said weighting values are adaptively different from each other.

Claim 23.   (Currently Amended) The cell search method according to Claim 22, characterized in that ~~the~~ ~~correspondence~~ ~~between~~ said weighting value ~~and~~ becomes smaller for said first average correlation value ~~is~~ ~~such~~ ~~that~~ the more previously ~~said~~ ~~first~~ ~~average~~ ~~correlation~~ ~~value~~ is calculated relative to the time of the secondary averaging~~,~~ ~~the~~ ~~smaller~~ ~~said~~ ~~weighting~~ ~~value~~ ~~is~~.

Claim 24.   (Currently Amended) The cell search method according to Claim 23, characterized in that a decreasing rate ~~at~~ ~~which~~ of said weighting value ~~decreases~~ ~~increases~~ ~~consistently~~ ~~with~~ becomes relatively higher according to a movement speed of said mobile station.

Claim 25.   (Original)   The cell search method according to Claim 20, characterized in that said secondary averaging is a process of carrying out averaging after multiplying said first average correlation value and said already calculated fourth average correlation value by respective forgetting factors.

Claim 26.   (Original)   The cell search method according to Claim 25, characterized in that values of said forgetting factors are adaptively different from each other.

Claim 27.   (Original)   The cell search method according to Claim 26, characterized in that the value of said forgetting factor decreases consistently with the movement speed of said mobile station.

Claim 28.   (Original)   The cell search method according to Claim 15, characterized by further comprising a step of determining a state of said mobile station, and said repeating step is executed if at the step of determining the state, it is determined that said mobile station is communicating.

Claim 29.   (Cancelled).

Claim 30.   (Currently Amended) The mobile station according to ~~Claim 29~~ any one of Claims 32-34, characterized in that said second averaging time is different from said first averaging time.

Claim 31.   (Original)   The mobile station according to Claim 30, characterized in that said first averaging time is longer than said second averaging time.

Claim 32.   (Currently Amended) [[The]] A mobile station ~~according to Claim 29,~~ in a mobile communication system, the station characterized by ~~further~~ comprising:

means for despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

means for despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

means for descrambling a common pilot signal on the basis of the detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

means for detecting second slot boundaries on the basis of a fourth average correlation value calculated by subjecting said received signal to primary averaging at intervals of second averaging time;

means for determining whether or not said detected frame boundaries and scramble code are correct, wherein if the determining means determines the incorrectness of said frame boundaries or said scramble code, the means for detecting said frame boundaries and said scramble code group detects said frame boundaries and said scramble code group on the basis of said detected second slot boundaries; and

means for comparing the time elapsed since the start of the step of detecting said first slot boundaries with a predetermined upper limit value and ending the detection of said frame boundaries and said scramble code if it is determined as a result of the comparison that said elapsed time exceeds said upper limit value.

Claim 33.   (Currently Amended) [[The]] A mobile station according to Claim 29, in a mobile communication system, the station characterized by further comprising:

means for despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time,

means for despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

means for descrambling a common pilot signal on the basis of the detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

means for detecting second slot boundaries on the basis of a fourth average correlation value calculated by subjecting said received signal to primary averaging at intervals of second averaging time;

means for determining whether or not said detected frame boundaries and scramble code are correct, wherein if the determining means determines the incorrectness of said frame boundaries or said scramble code, the means for detecting said frame boundaries and said scramble code group detects said frame boundaries and said scramble code group on the basis of said detected second slot boundaries; and

means for comparing the number of times that said frame boundaries and said scramble code have been detected with a predetermined upper limit value and ending the detection of said frame boundaries and said scramble code if it is determined as a result of the comparison that said number of times exceeds said upper limit value.

Claim 34.   (Currently Amended) [[The]] A mobile station according to Claim 29, in a mobile communication system, the station characterized in that the by comprising:

means for despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

means for despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

means for descrambling a common pilot signal on the basis of the detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

means for detecting second slot boundaries on the basis of a fourth average correlation value calculated by subjecting said received signal to primary averaging at intervals of second averaging time; and

means for determining whether or not said detected frame boundaries and scramble code are correct,

wherein if the determining means determines the incorrectness of said frame boundaries or said scramble code, the means for detecting said frame boundaries and said scramble code group detects said frame boundaries and said scramble code group on the basis of said detected second slot boundaries, and

wherein said means for detecting said second slot boundaries calculates a fifth average correlation value by executing secondary averaging on the basis of said first average correlation value and said already calculated fourth average correlation value, and detects second slot boundaries on the basis of the calculated fifth average correlation value.

Claim 35.   (Original)   The mobile station according to Claim 34, characterized in that said secondary averaging is a process of carrying out averaging after weighting said first average correlation value and said already calculated fourth average correlation value.

Claim 36.   (Original)   The mobile station according to Claim 35, characterized in that said weighting values are adaptively different from each other.

Claim 37.   (Currently Amended) The mobile station according to Claim 36, characterized in that the correspondence between said weighting value and becomes smaller for said first average correlation value is such that the more previously said first average correlation value is calculated relative to the time of the secondary averaging, the smaller said weighting value is.

Claim 38.   (Currently Amended) The mobile station according to Claim 37, characterized in that a decreasing rate at which of said weighting value decreases increases consistently with becomes relatively higher according to a movement speed of said mobile station.

Claim 39.   (Original)   The mobile station according to Claim 34, characterized in that said secondary averaging is a process of carrying out averaging after multiplying said first average correlation value and said already calculated fourth average correlation value by respective forgetting factors.

Claim 40.   (Original)   The mobile station according to Claim 39, characterized in that values of said forgetting factors are adaptively different from each other.

Claim 41.   (Original)   The mobile station according to Claim 40, characterized in that the value of said forgetting factor decreases consistently with the movement speed of said mobile station.

Claim 42.   (Currently Amended) [[The]] A mobile station ~~according-to-Claim-29, characterized-in-that~~ in a mobile communication system, the station characterized by comprising:

means for despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time,

means for despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

means for descrambling a common pilot signal on the basis of the detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

means for detecting second slot boundaries on the basis of a fourth average correlation value calculated by subjecting said received signal to primary averaging at intervals of second averaging time; and

means for determining whether or not said detected frame boundaries and scramble code are correct,

wherein if the determining means determines the incorrectness of said frame boundaries or said scramble code, the means for detecting said frame boundaries and said scramble code group detects said frame boundaries and said scramble code group on the basis of said detected second slot boundaries, and

wherein said determining means execute said determination if said mobile station is communicating.

Claim 43.   (Original)   A mobile station in a mobile communication system, the station being characterized by comprising:

means for despreading a received signal with a spreading code common to all slots and detecting first slot boundaries on the basis of a first average correlation value calculated at intervals of first averaging time;

means for despreading said received signal with different spreading codes for said respective slots on the basis of the detected first slot boundaries and detecting frame boundaries and a scramble code group on the basis of a second average correlation value;

means for descrambling a common pilot signal on the basis of said detected frame boundaries and scramble code group, and detecting a scramble code on the basis of a third average correlation value;

means for detecting second slot boundaries on the basis of a fourth average correlation value calculated through primary averaging executed at intervals of second averaging time; and

means for suspending the detection by the means for detecting said frame boundaries and said scramble code group or the means for detecting said scramble code, and detecting said frame boundaries and said scramble code group on the basis of said detected second slot

boundaries, if said detected second boundaries are different from said first slot boundaries or said second slot boundaries detected during a last cell search.

Claim 44.   (Original)   The mobile station according to Claim 43, characterized in that said second averaging time is different from said first averaging time.

Claim 45.   (Original)   The mobile station according to Claim 44, characterized in that said first averaging time is longer than said second averaging time.

Claim 46.   (Original)   The mobile station according to Claim 43, characterized by further comprising means for comparing the time elapsed since the start of the step of detecting said first slot boundaries with a predetermined upper limit value and ending the detection of said frame boundaries and said scramble code if it is determined as a result of the comparison that said elapsed time exceeds said upper limit value.

Claim 47.   (Original)   The mobile station according to Claim 43, characterized by further comprising means for comparing the number of times that said frame boundaries and said scramble code have been detected with a predetermined upper limit value and ending the detection of said frame boundaries and said scramble code if it is determined as a result of the comparison that said number of times exceeds said upper limit value.

Claim 48.   (Original)   The mobile station according to Claim 43, characterized in that the means for detecting said second slot boundaries calculates a fifth average correlation

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value by executing secondary averaging on the basis of said first average correlation value and said already calculated fourth average correlation value, and detects second slot boundaries on the basis of the calculated fifth average correlation value.

Claim 49.   (Original)   The mobile station according to Claim 48, characterized in that said secondary averaging is a process of carrying out averaging after weighting said first average correlation value and said already calculated fourth average correlation value.

Claim 50.   (Original)   The mobile station according to Claim 49, characterized in that said weighting values are adaptively different from each other.

Claim 51.   (Currently Amended))The mobile station according to Claim 50, characterized in that the correspondence between said weighting value and becomes smaller for said first average correlation value is such that the more previously said first average correlation value is calculated relative to the time of the secondary averaging, the smaller said weighting value is.

Claim 52.   (Currently Amended) The mobile station according to Claim 51, characterized in that a decreasing rate at which of said weighting value decreases increases consistently with becomes relatively higher according to a movement speed of said mobile station.

Claim 53.   (Original)   The mobile station according to Claim 48, characterized in that said secondary averaging is a process of carrying out averaging after multiplying said first average correlation value and said already calculated fourth average correlation value by respective forgetting factors.

Claim 54.   (Original)   The mobile station according to Claim 53, characterized in that values of said forgetting factors are adaptively different from each other.

Claim 55.   (Original)   The mobile station according to Claim 54, characterized in that the value of said forgetting factor decreases consistently with the movement speed of said mobile station.

Claim 56.   (Original)   The mobile station according to Claim 43, characterized in that said determining means execute said determination if said mobile station is communicating.